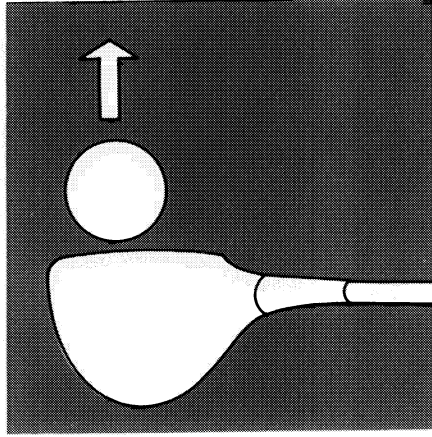


Conventional



DynaTorque

*Materials for better golf clubs developed from NASA composite-material data have been designed by Babcock & Wilcox Co. The "DynaTorque" graphite composite allows a lighter shaft in relationship to the club head, resulting in easier swings and better control as shown above.*



## Packaged food

NASA-Johnson's experience in producing space-craft food and food systems is being spun off to develop meal packages that don't require refrigeration.

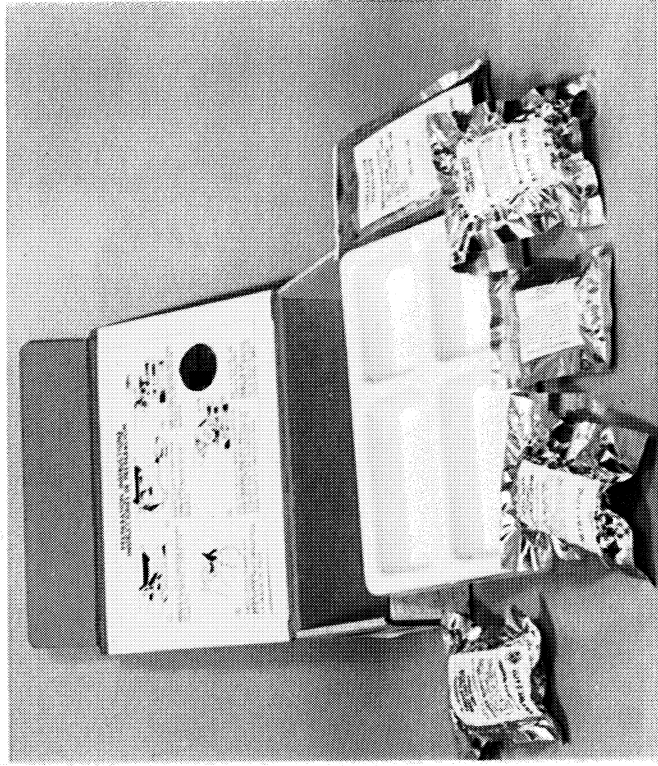
Congressional studies have found that many elderly persons don't eat adequately either because they can't afford to, because of limited mobility, or because they just don't bother.

Reacting to a request from the Texas Governor's Committee on Aging, the Johnson Space Center is developing shelf-stable foods processed and packaged for home preparation with minimum effort. Various food-processing techniques and delivery systems are under study. The program, an applications project of the Technology Utilization Office is a cooperative venture including the University of Texas, Texas Research Institute for the Mental Sciences, and United Action for the Elderly Inc.

Food taste, package designs, and a delivery system developed by Technology Inc. were tested late last year in seven central-Texas rural areas. A three-month field test of the entire system will be conducted this year to evaluate foods, packaging, delivery systems, distribution logistics, and reactions of the users.

Compressed and freeze-dried foods developed by Johnson originally for space flight applications





also are being marketed by Innovative Foods Inc. in California for campers and as compact emergency food rations.

### **Safer pleasure boats**

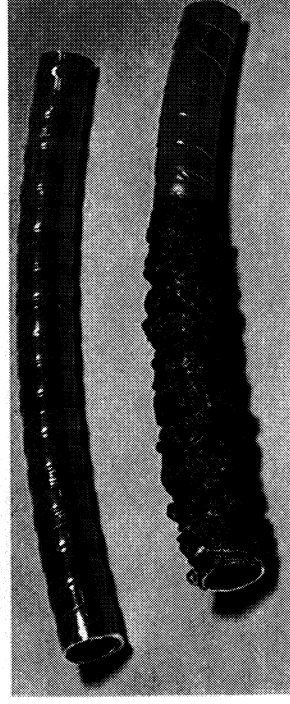
One of the main hazards of gasoline-fueled pleasure boats is fire or explosion. An Ames Research Center coating developed to protect air- and space-craft now has been transferred to reduce this danger.

The Ames coatings contain dispersions of nitro-amino-aromatic compounds that decompose and swell the original coating 70 to 200 times its original thickness. The decomposition gases, water, and sulfur dioxide all quench fires. And the low-density

foam that remains provides insulation and forms a char that can re-radiate heat.

Avco Corp. contracted with Ames to test these coatings and foams, was licensed to practice the technology to protect fuel tanks and fuel lines of military aircraft. From there, they were further developed as tapes and coatings to protect fuel hoses on inboard pleasure boats as well as for protecting the interior of fiberglass hulls. As much as 100,000 sq ft of the covering material now are sold monthly to hose manufacturers.

Avco is working this year with the Boating Industry Association and the U.S. Coast Guard to develop adaptations of the coating for fuel tanks and engine-compartment walls.



*"Flamarest," coating developed by Avco Corp. for NASA to protect fuel lines and tanks, is sprayed on the interior of a polyester boat hull in a commercial application. About 30 mils of the coating prevented structural damage to this hull during a test in which a 13-minute interior gasoline fire was started. An unprotected hull would begin to burn in 30 seconds. Above, the same material applied as tape to wrap fuel lines effectively insulates the bottom hose when charred, while also reducing the spread of flame.*

